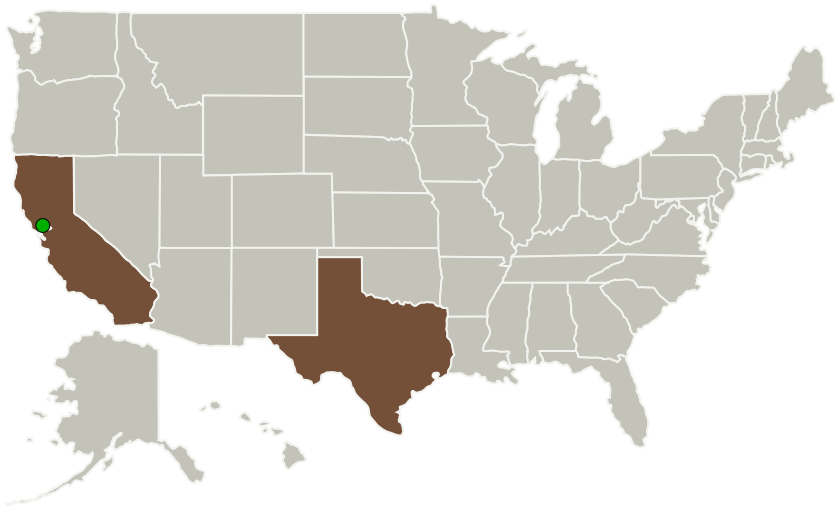
Ontological Models to Support Planning Operations, Phase I

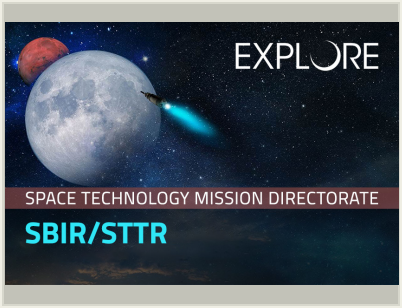
Completed Technology Project (2011 - 2011)

Project Introduction

Automation and autonomy technologies, such as automated planning software, are key elements in realizing the vision for space exploration. A fundamental requirement for success with these technologies is that they operate using valid models or ontologies of the application domains. Making ontological information available to automated systems is difficult because 1) domain experts reason in domain terms, not the formal logic of ontologies; 2) the states and configurations of the specific objects in the domain are both voluminous and dynamic, making manual entry and maintenance prohibitive; and 3) the data required, especially state updates, need to be extracted or imported from other disparate systems. This proposal seeks to investigate, design and test a framework for consistent ontological modeling both within and across domains that can be exploited by automated planners currently being developed by NASA's exploration technology program. Specifically we will investigate a modeling framework that provides 1) an ontological representation of domain information in a standard format that can be used by NASA's developing planning software, 2) an interactive editing environment to allow domain experts to construct and maintain the ontological information; and 3) a general, systematic, and maintainable semantic mapping from external data sets into the user-constructed ontology.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
TRACLabs, Inc.	Lead Organization	Industry	Webster, Texas
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Texas

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140232)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

TRACLabs, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Russell Bonasso

Co-Investigator:

Russell Bonasso

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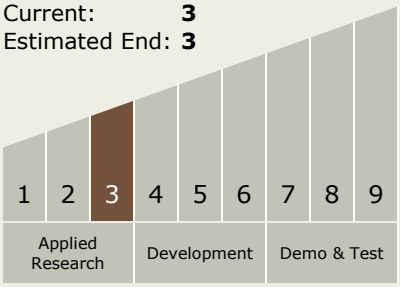
Technology Maturity (TRL)

Start: **3**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX10 Autonomous Systems
  - TX10.2 Reasoning and Acting
    - TX10.2.1 Mission Planning and Scheduling

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System